THE LANGLEY DAAC
newsletter

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The Langley TRMM Information System

The Langley TRMM Information System (LaTIS) is designed to support the ingest, processing, archival, quality assurance and distribution of the Clouds and Earth's Radiant Energy System (CERES) data on the Tropical Rainfall Measuring Mission (TRMM). LaTIS is being designed to comply with the EOSDIS Version 0 Functional Requirements and additional requirements from the CERES instrument team.

The development of the LaTIS system started in January 1997. The initial tasks of the development were choosing the team to develop LaTIS and ordering the hardware needed for LaTIS. The initial team was drawn from the Langley DAAC staff and has been supplemented since then. The primary hardware purchases for LaTIS have been SGI Origin 2000 units. The unit to support the CERES product generation has 32 CPUs (R10000 processors), 8 GB of RAM and 500 GB of disk space.

The LaTIS design reuses Version 0 components from the ingest (Version 0 ingest), archival (Version 0 data archive and distribution system), product generation (Version 0 product generation), ordering (Version 0 IMS), and distribution (Version 0 data archive and distribution system) systems.

The ingest system is being modified to automate the cataloging and inspection processes. The CONSIM software, which will be used to transfer the EOS AM1 Level 0 data, is being used to transfer the Level 0 CERES data to the Langley DAAC. Additional metadata will be extracted during the ingest process to support expanded search and cataloging criteria.

The archival system is being modified to interface with the data cataloging system. A StorageTek robotic tape library will be used as the primary archive of the CERES data.

The product generation system will be enhanced to support the higher processing demands from CERES versus the current ERBE processing. Knowledge gained during the current ERBE reprocessing at the Langley DAAC will be used to enhance the current product generation system.

The ordering system will be changed primarily by including additional fields and methods to refine searches which have been suggested by the users and by the CERES science team. The prototype Langley DAAC web-based ordering system is being developed in response to user feedback to increase web access to the DAAC's holdings. (See the article on page 2 for an update of the Langley DAAC web prototype.)

The distribution system is being modified to increase automation, and several robotic tape handlers have been purchased. The Version 0 media order filling software is being modified to utilize these devices.

Additionally, an interface will be created between the LaTIS system and the CERES Science Computing Facility (SCF). The CERES SCF will connect to the LaTIS system through the product generation system and the distribution system. The CERES science team will perform quality assurance at the SCF and will provide the results to the LaTIS system for users to access.

The LaTIS system is also using parts of the EOSDIS Core System (ECS) developed software, such as the Science Data Processing (SDP) toolkit, and is conforming to ECS standards (e.g., for metadata) to

LaTIS System Architecture

WEB-Based Data Search
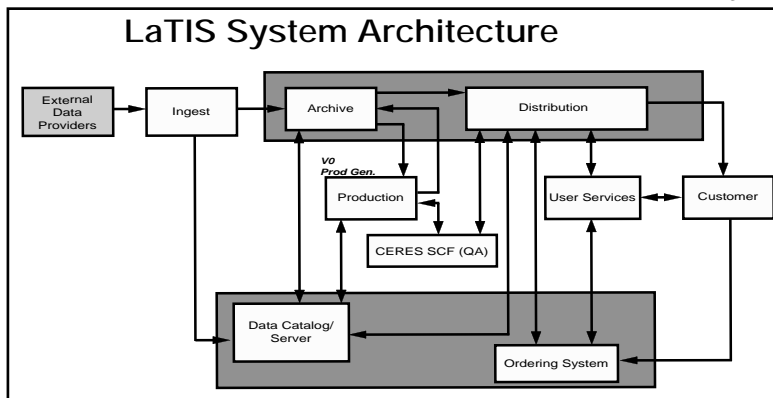
In an ongoing effort to offer customers increased access to data at the Langley DAAC, the Web Development Team has enhanced the HTML-driven data search and access prototype (*see The Langley DAAC Newsletter, Vol. II, No. 1, Summer 1997*). Incremental versions continue to be made available to allow DAAC customers the opportunity to use the increased functionality and to make recommendations for future modification. With the version made available on August 14, customers may search the DAAC data inventory, obtain a list of available data set granules, and directly download data granules or browse images that are available for electronic transfer.

The search process is based on a refinable key word search where a customer enters a key word or list of key words in an HTML form which posts the information to a search engine at the DAAC. Key words may be words or character strings which are applicable to the DAAC project, data set, sensor, or parameter entries and may use the % symbol as a wild card. A key word search returns five display fields (Campaign/Project, Source/Platform, Sensor/Instrument, Parameter, and Data Sets) showing the entries pertinent to the search. For example, entry of the string "%oz" would return all of the entries involving ozone parameters. Similarly, entry of the string "fire" would return all of the entries for the FIRE Project. The search engine also provides the ability to refine searches based on selections from one of the five display fields and to display a more narrow set of results that are context sensitive to the search criteria. The refinement step can be repeated as often as needed.

Upon completion of a search, the customer may click on desired data sets and, if desired, enter temporal constraints for the data sets. At this point, a list of granules for the selected data sets may be viewed, and any granules or associated browse images available for electronic transfer may be downloaded. Work is in progress to provide a useful display of the valid time ranges of data sets to aid in choosing time parameters for searches.

The prototype now also includes a customer registration interface which allows customers who have registered previously to enter only a unique login name (last name plus last four digits of phone number). Registration is not required to perform searches but is required for downloading data. Last minute registration is allowed for customers who choose not to register initially but later find data desired for download after completing a search.

Browser detection has been implemented in the prototype so a range of interfaces can be provided based on the capabilities of the user's browser. A Java based interface is being developed to give users with Java enabled browsers more interactive tools for selecting search constraints. To check out the Beta server access tool, go to http://eosweb/HPDOCS/ access_data.html and click on "Prototype Langley DAAC Web Based Ordering System."

The next areas of emphasis for the Web Development Team will be to add new functionality to make read software available for download, display time ranges for data sets, process media orders via web interface, and display thumbnail images of applicable data.

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LaTIS Overview (continued from page 1)

limit the new development for both the CERES and DAAC staffs.

The LaTIS system successfully passed the two TRMM mission simulations. The Mission Simulation #2 tested the LaTIS capabilities of ingesting, archiving and processing Level 0 CERES data. The Mission Simulation #3 tested the LaTIS capabilities of compiling and building CERES product generation executables (PGEs), ingesting Level 0 CERES data, archiving the Level 0 CERES data, creating and tracking a backup of Level 0 data and running CERES PGEs creating data files to be archived.

To ensure the successful development and deployment of the LaTIS system, the design has called for the reuse of Version 0 components, maximum use of commercial off the shelf (cots) software to automate processes, and use of ECS developed software to limit the amount of new work needed. Frequent interactions with customers (CERES science team and others) will ensure LaTIS provides the science community with an intuitive and accessible interface to the DAAC's data holdings.

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SAGE II

Paper

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Outreach

Activities

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SAGE II Paper to be Published

The *Journal of Geophysical Research* is publishing in an upcoming issue a paper entitled "Atmospheric absorption during ARESE" by Charles S. Zender, Brett Bush, Shelly K. Pope, Anthony Bucholtz, William D. Collins, Jeffrey T. Kiehl, Francisco P. J. Valero, and John Vitko, Jr. The paper illustrates an application of Stratospheric Aerosol and Gas Experiment II (SAGE II) data available from the Langley DAAC. The SAGE II Aerosol measurements were used to estimate the optical depth of the stratospheric sulfate aerosol over the experiment site. SAGE II Nitrogen Dioxide (NO_2) measurements above 20 km were used in the development of the total model column NO_2. The abstract from the paper follows:

The Abstract:

The objectives of the ARM Enhanced Shortwave Experiment (ARESE) are to directly measure clear and cloudy sky shortwave atmospheric absorption, and to quantify any absorption found in excess of model predictions. We undertake detailed model comparisons to near infrared and total solar flux time series observed by surface and airborne RAMS instruments during the ARESE campaign. Model clear sky absorption biases generally fall within the range of uncertainty generated by sample size, and assumptions of aerosol properties and surface albedo. Direct measurements by stacked aircraft on the overcast day of October 30, 1995 confirm the detection of enhanced cloud shortwave absorption during ARESE. The detection is substantiated by, and consistent with, three independent measures of cloudy sky absorption estimated in previous studies: cloud forcing ratio, insolation forcing ratio, and albedo/transmission slope. A significant portion of the enhanced absorption occurs at visible wavelengths. Collected measurements of liquid water path (LWP) suggested the magnitude of the enhanced absorption increase with LWP.

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Teachers Help with DAAC Educational Projects

The Langley DAAC hired two teachers during the summer to help with educational projects at the DAAC. Nichole Silvers is an elementary teacher in Newport News, Virginia and Eric Goldman teaches high school Earth Science in York County, Virginia. Both teachers had the task of designing and creating sets of science trading cards, similar to baseball cards, for conference and exhibit handouts.

The first set uses Earth Radiation Budget Experiment (ERBE) to help explain radiation science. Eric and Nichole developed puzzles and lesson plans for teachers to use in conjunction with the cards. The cards are now being reviewed by ERBE scientists before being printed.

Also, on their list this summer was the CERES Students' Cloud Observations On-Line (S'COOL) project (http://asd-www.larc.nasa.gov/SCOOL/). This is a project for classrooms across the country to provide ground-based cloud observation data to Langley researchers to compare to satellite data. Nichole and Eric designed a brochure to advertise the project and a poster to be used in the classroom.

Nichole will remain with the Langley DAAC on a part-time basis to continue work on future sets of trading cards as well as other upcoming Outreach projects.

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S'COOL Preparing for Next Phase of Testing

The S'COOL program is preparing for its next phase of testing, scheduled for October 20-24, 1997. This test will be the first time classes from outside the United States will be participating. This will also be the first time students will be entering the observations directly into a database, allowing classes to compare their measurements with other classes.

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SUCCESS PDL Data Available

Data from the University of Utah Polarization Diversity LIDAR (PDL) taken during the Subsonic Aircraft: Contrail and Cloud Special Effects (SUCCESS) Mission are now available at the Langley DAAC. During April and May 1996, the SUCCESS field program used instrumented aircraft and ground-based measurements to investigate the effects of subsonic aircraft on contrails, cirrus clouds, and atmospheric chemistry.

The PDL was one of several ground-based instruments located at the Department of Energy's (DOE) Southern Great Plains Clouds and Radiation Testbed (CART) site in Lamont, Oklahoma. Nineteen sets of cirrus cloud and contrail observations were made over thirteen days, including extensive fields of contrails from nearby commercial jet corridors as well as those generated by the participating NASA aircraft.

The data include both the raw LIDAR returned signal values (with background subtracted), stored in ASCII files, and Postscript image files generated from the raw data. The image files are also viewable directly in the X windows version of the LaRC DAAC data ordering system as browse images.

The SUCCESS mission was planned to better determine the radiative properties of cirrus clouds and contrails. Objectives included better understanding of cirrus cloud formation, whether subsonic aircraft exhaust affects that formation and, if so, what impact there might be on climate. More information about the SUCCESS project can be found at their web site: http://cloud1.arc.nasa.gov/success

The Langley DAAC

The Langley DAAC Newsletter is a quarterly publication of the Langley Distributed Active Archive Center, NASA Langley Research Center, Hampton, VA 23681-0001. Submit contributions, comments, or questions to the editor via e-mail (userserv@eosdis.larc.nasa.gov) or contact the Langley DAAC User and Data Services office at (757) 864-8656, FAX (757) 864-8807.

The Langley DAAC has developed a graphical user interface which allows users to search the DAAC's data inventory, view browse images, choose desired data sets, and place orders. This system, as well as a character-based system, are accessible via our Home Page:

http://eosweb.larc.nasa.gov

The Web Page also allows users to order CD-ROMs and videocassettes, download and place media orders for select data sets, and search for documentation. Users can also get access to data at other centers via the Earth Observing System Data and Information System (EOSDIS) World Wide Web Gateway.

EOSDIS Conference Exhibits

October 28-30, 1997
GIS/LIS (Geographic Information Systems
/Land Information Systems)
Cincinnati, Ohio

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December 9-11, 1997
AGU (American Geographical Union)
San Francisco, California

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January 12-15, 1998
AMS (American Meteorological Society)
Phoenix, Arizona

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